TROPICAL FOREST NOTES

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No. 2

PRESERVATION OF PUERTO RICAN FENCE POSTS TREATED BY COLD SOAKING AND THE HOT-AND-COLD BATH METHOD

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It is well known that the treatment of non-durable fence posts with a good oil-borne preservative at a retention of six pounds per cubic foot and accompanied by good penetration will increase the service life of the posts several fold. Most of the trees in Puerto Rico which yield naturally durable fence posts have been cut, and the non-durable species last only from six months to two years. Very little was known regarding the treating qualities of the Puerto Rican woods, so a study was made in 1958 on the treatability of the more common species. This note is a summary of the information on the treatment of 52 species by cold soaking with 5 percent pentachlorophenol in Diesel oil, 21 species by the hot-and-cold bath method with 5 percent pentachlorophenol, and 10 species by both treating methods with a 50-50 creosote and Diesel oil solution. Two percent No.6 fuel oil was used to darken the pentachlorophenol solution in order to aid in the determination of preservative penetration.

The six-foot posts with average diameters of about three inches were peeled soon after cutting, and air dried for about three months to a moisture content of 16 to 20 percent based on the oven dry weight of the wood before treatment.

All posts were treated full length in the preservatives. The posts treated by cold soaking were immersed for five days at an air temperature of about 80°F. The posts treated by the hot-and-cold bath method were first immersed in the hot preservative at a temperature of 200°F from two to three hours and then in the cold preservative for a few hours to 5 days, depending on the amount of preservative absorbed. An attempt was made to remove the posts after absorbing 8 pounds per cubic foot, but some species absorbed the preservative faster than expected. Those species, however, absorbing less than 8 pounds per cubic foot were in the cold bath for 5 days. Whereas 6 pounds of preservative per cubic foot of wood is generally recommended as a minimum retention for fence posts in the temperate zones, 8 pounds per cubic foot was chosen as a minimum retention for Puerto Rican conditions.

A Operated in cooperation with the University of Puerto Rico.

The charts in figures 1 and 2 are a diagrammatic representation of the results of these treatments. The figure following the common name of a species is the preservative retention in pounds per cubic foot. The penetration measurements are averages of those taken at 1-foot intervals along the posts. It should be emphasized that the ground line is the most critical zone in the life of a post, and penetration and retention should be greatest there. For the ten species treated with creosote and the same ten species treated with pentachlorophenol, 51 posts of the species were treated. From these, five posts with average retentions were cut either lengthwise or crosswise, or both ways when necessary, to determine penetration. For all other species, 26 replicate posts were used in a treatment of which three posts with average retentions were examined for penetration. All penetration measurements were made on freshly cut surfaces before the preservatives could spread to untreated areas.

The amount of heartwood which shows as a darker area on the charts was measured both when the posts were freshly cut and again when the treated posts were examined for preservative penetration. The preservative did not penetrate the heartwood except to a limited extent at the ends of the posts.

The data in these charts show that only a few species in the cold soak treatment absorbed 8 pounds per cubic foot of preservative with 50 percent or more sapwood penetration, while most species treated by the hot-and-cold bath method absorbed this amount of preservative with 50 percent or more of sapwood penetration. The service life, that is, the effectiveness of treatment, is being determined for all species and treatments by field tests.

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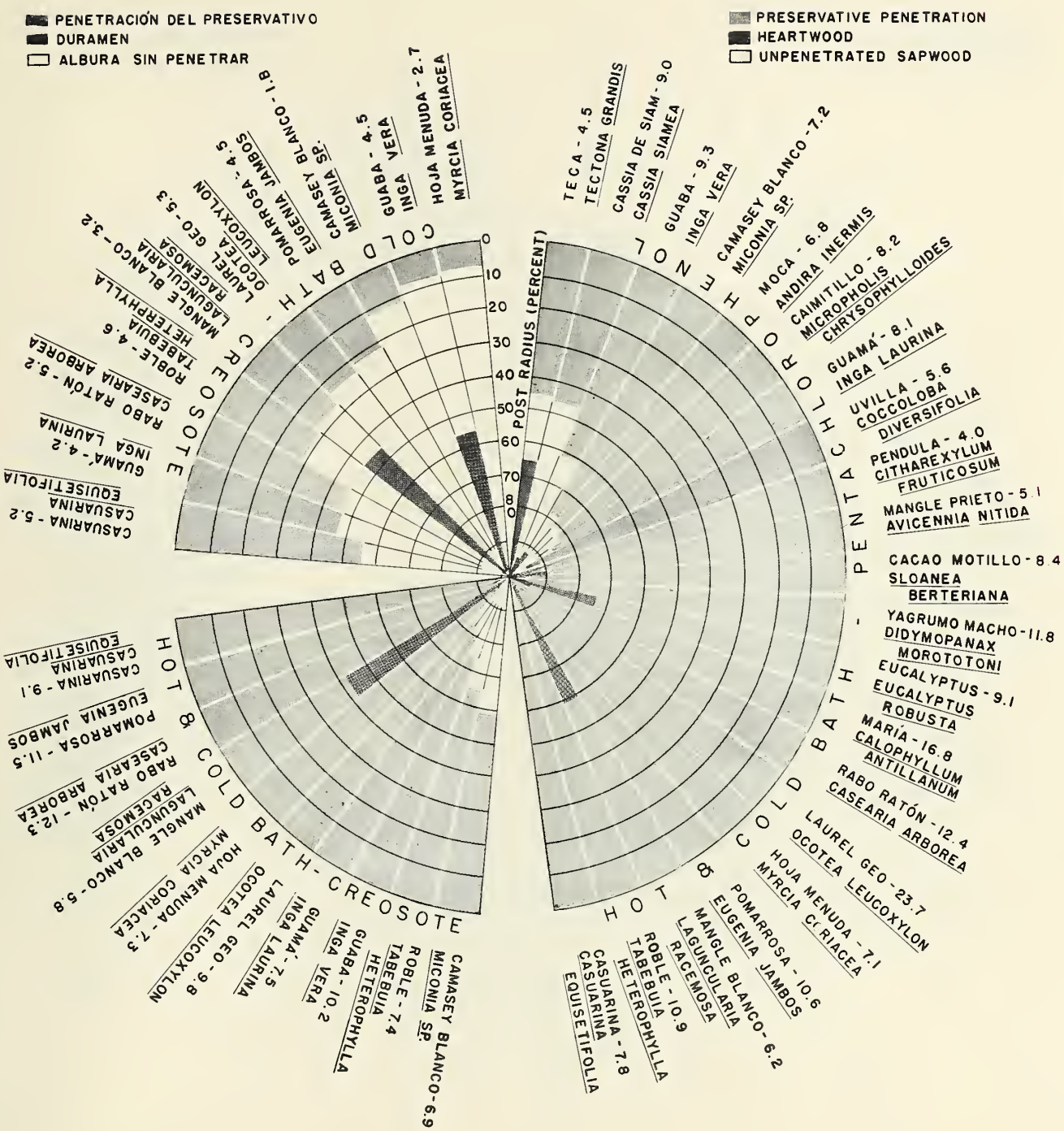

Figure 2.--A diagrammatic representation of the average retention of preservative in percent of the radii of species grown in Puerto Rico. The species were treated with 5 percent pentachlorophenol by the hot-and-cold bath method, and with a 50-50 solution of creosote-Diesel oil by cold soaking and the hot-and-cold bath method. The figures following the common name of a species is the average retention of preservative in pounds per cubic foot.

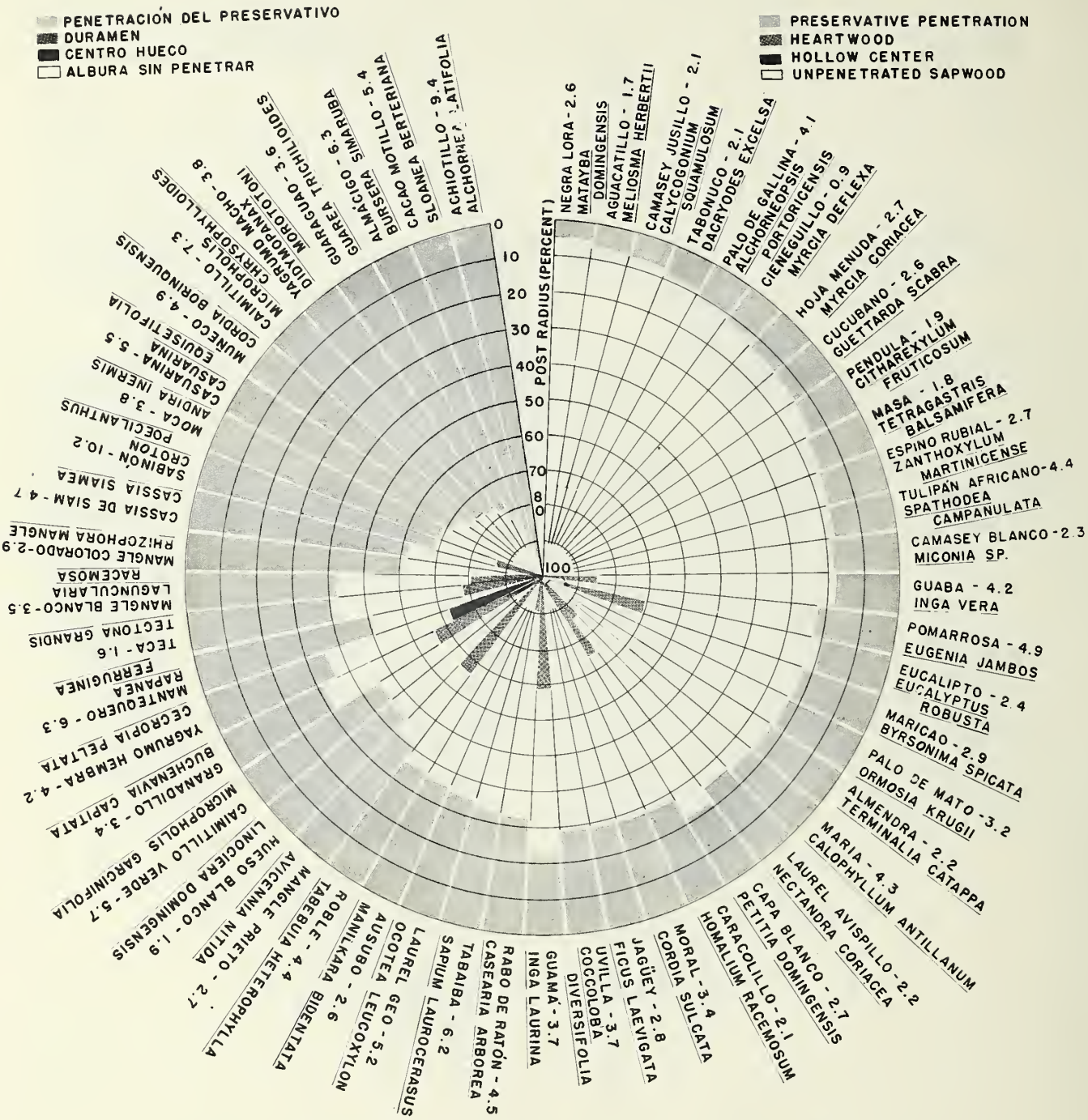

Figure 1.--A diagrammatic representation of the average penetration of preservative in percent of the radii of 52 species of trees grown in Puerto Rico. The posts were treated full length for 5 days in 5 percent pentachlorophenol in Diesel oil at air temperature. The figure following the common name of a species is the average retention of preservative in pounds per cubic foot.